






## Drawer slide

**Publication number:** EP0768050  
**Publication date:** 1997-04-16  
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**Classification:**  
- **International:** A47B88/04; A47B88/04; (IPC1-7): A47B88/04  
- **European:** A47B88/04S  
**Application number:** EP19960116295 19961011  
**Priority number(s):** DE19951038101 19951013

**Also published as:**

 EP0768050 (A3)  
 DE19538101 (A1)  
 EP0768050 (B1)

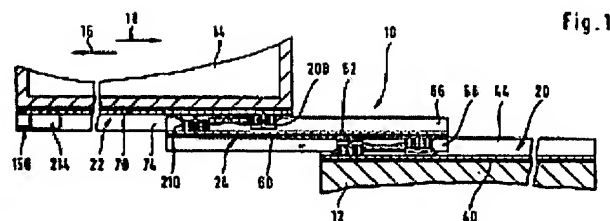
**Cited documents:**

 US4696582  
 DE8114891U

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**Abstract of EP0768050**

The second guide rail (22) is moved along the first guide rail (20) on the side of the main body (12) by means of roller bodies in a cage. The second guide rail is movable between a pushed-in position and pulled-out end position. A pair of brake elements (100, 102) are moved towards each other to reach an end position. One of the brake elements is in the form of an especially conically tapering holder into which moves the other brake element, and subsequently generates an opposing rotation brake operation.

**Fig. 1**

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Description of EP0768050

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The invention concerns a statement leadership for statements extensible out of a body, comprehensively a body page first leadership rail and one at this by means of in a Wälzkörperkäfig included Wälzkörpern in Ausziehrichtung verschieblich led second leadership rail which is relative to the first leadership rail between a pushed in and a removed end position movable.

Such statement leaderships are well known out of the state of the technology. With this, the problem exists to avoid and to reach a so-called "blow" in reaching of the pushed in or removed end position that this position is braked reached if possible in order to avoid the "blow".

Out of the US 5,181,781 is has to be sure well known to plan a push absorbent Puffer to the damping of the blow in reaching of the full removed position, this Puffer however the disadvantage that it shows in Ausziehrichtung a feather effect, so that a good shock damping prefaces a high elasticity, that has again an elastic rebounding after damping of the blow in reaching of the end position as a consequence, what is in this context undesirable.

Furthermore a statement leadership is out of the US-patent 5,181,781 well known, which shows a body page leadership rail, a statement page leadership rail and a middle leadership rail, whereby the Mitnahme of the middle leadership rail takes place via a Festlegeeinrichtung.

The task of avoiding "the blow", is solved in a statement leadership of the from the outset described type invention appropriate for in that for conveying one of the end positions two are planned before reaching of the end position cooperating Anbremsselemente, that the Anbremsselemente are for reaching the end position on each other movable through a relative movement in a direction of motion, that one of the Anbremsselemente as a reception especially conical narrowing in direction of motion on the respective end position to itself The Anbremsselemente as into the conical reception hineinbewegbares part instructed is and that to the production of one of the relative movement opposed brake effect is one of the Anbremsselemente based on the cooperating of that with increasing approach at the end position within a brake way lying before the end position increasingly deformierbar.

The advantage of the invention appropriate for solution is to be seen therein that over the reception conical narrowing itself on the one hand and the deformation is attainable one of the Anbremsselemente on the other hand in constructive simpler manner an efficient brake effect, whereby the brake force with increasing approach increases at the end position based on the increasing deformation of the corresponding Anbremsselements, so that the desirable soft, increasingly braked shrinking of the statement leadership is attainable into the end position. Moreover is reached therewith that in the Wegbewegen of the end position a back stop power slighter becoming with increasing distance by the end position causes.

In contrast to the US 5,181,781, the invention appropriate for solution enabled a back feather free braking before reaching of the end position whereby this has no influence on the end position, while in the US 5,181,781, that unimpeded is reached end position, then over the end position out elastically braked becomes and in the end again to the end position zurückgefedert becomes.

In contrast to the US 5,181,782 emerges in the invention appropriate for solution also in the bringing in into

the end position and in the Wegbewegen of the end position NO Rastrucken at all and Rastgeräusch because the invention appropriate for Abbremsung resulted only by means of friction and therefore rastfrei, so that also in the out load out of the end position solely friction is to be overcome.

Especially appropriately it is sharpen shows there, if the reception at least one to the Ausziehrichtung or Einschieberichtung in one angle start area inclined because this in more simply manner guarantees the possibility to reach the deformation of the corresponding Anbremsselements.

Especially appropriately it is sharpen shows, if the reception two symmetrical to the Ausziehrichtung or Einschieberichtung and in that angle to these passing start areas because therewith a deformation effect symmetrical diagonally to the Ausziehrichtung or Einschieberichtung can be reached and therefore also symmetrical power effect, because the effective powers in more simply manner can be canceled against each other, if both start areas symmetrical to the Ausziehrichtung or Einschieberichtung arranged are.

After the braking in the reception defining the brake way, the Anbremsselemente in the end position remain stand based on the friction relatively to each other.

A Herausbewegen out of the end position leads to a reversed passing through of the brake way whereby the frictional powers working against the movement over the brake way become increasingly slighter and therefore also a soft Herausgleiten is out of the end position the consequence.

Fundamentally the end position can be defined is planned by as desired arranged additional attack elements to define around the end position in simpler manner exactly preferably that the reception shows one Endanschlagfläche passing diagonally to the Ausziehrichtung.

In the connection with the previous explanation of the single execution examples was not gone in on that, which forms both Anbremsselemente the deformierbare Anbremsselement. So an advantageous execution example plans that the Anbremsselement, which shows that into the reception einschiebbare part, is, deformierbar. This solution has the advantage that the Anbremsselement carrying the start areas stare can be instructed, so that the start areas themselves retain its form and that against these causing parts carries out the deformation.

For example it would be possible to form that into the reception einschiebbare part as an entire deformierbar.

It is especially advantageous however if that shows into the reception hineinbewegbare part at least an advantage cooperating within the brake way with one the start areas. Therewith the possibility is created to dosed over the education of the advantage the power stemming out of the deformation. For example it would be possible to instruct the advantage stare and, for example in the area of its reason body, to give the part a deformierbaren area. It is especially advantageous however if the advantage deformierbar is, because therewith, especially through the form of the advantage in simpler manner the power required to the Deformierung can be dosed.

The advantage could for example as a hump or similar instructed be. Especially advantageously it is if the advantage is instructed as a finger, which causes against the start area.

To can if possible exactly dosed around especially the brake force is planned preferably that the advantage is instructed itself as with increasing approach at the end position based on its deformations verschwenkender fingers, so that the brake force effect takes place primarily via the Verschwenken of the finger. Such a trained finger reinforces the brake force in the bringing in and has a slight friction in the pulling out out of the reception. This effect realization especially through it that in an elastic or elastically stored finger in the bringing in the friction leads at a Reibpunkt of the finger at the reception to a torque causing on the finger, which the Anpresskraft at the Reibpunkt yet more increased in contrast to that reverses itself in the Herausbewegen of the finger out of the reception the torque, with the effect, that the Anpresskraft decisive for the friction.

An especially appropriate execution form of the invention appropriate for solution plans that the finger causes itself with increasing approach at the end position with one in direction of its direction of motion relatively to the reception verschwenkt, so that the finger with increasing approach at the end position with an increasing power against the start area and enlarges therefore the friction at this while in the Herausbewegen out of the end position the friction is considerably slighter, there Fingers against the

assembly areas cause more slightly becomes with increasing distance of the end position.

Exactly to be able to determine around furthermore the end position is planned preferably that the finger is at the Endanschlagfläche anlegbar.

In order to received a power effect symmetrical if possible diagonally to the Ausziehrichtung or Einschieberichtung, is planned preferably that that shows into the reception einschiebbare part two symmetrical to the Ausziehrichtung arranged and by this standing off advantage.

With respect to the arrangement of the Anbremsselements comprehensive the reception and the the Anbremsselements comprehensive into the reception einschiebbare part no nearer statements were made until now. So is planned preferably that the Anbremsselemente between the leadership rails and between that are arranged these Wälzkörpern leading upper and lower to each other. This solution has the large advantage that the Anbremsselemente do not overcome over the statement leadership itself and can be fixed in simple type and manner.

An especially advantageous execution example plans that one of the Anbremsselemente sits at one of the leadership rails and the other is arranged at the Wälzkörperkäfig, preferably endseitig of the same. This solution has the large advantage that the Wälzkörperkäfig itself carries one of the Anbremsselemente and therefore already no spatial problems exist to position this Anbremsselement carried by the Wälzkörperkäfig so that the Wälzkörperkäfig can at this vorbeilaufen.

Especially advantageously it is in this solution if the other Anbremsselement is at the Wälzkörperkäfig einstückig angeformt, because therewith in more simply manner of this Anbremsselement can be integrated into the statement leadership.

It is especially advantageous braked is there, if the removed end position of the statement leadership by means of the Anbremsselemente anfahrbar. If one of the Anbremsselemente is arranged at the Wälzkörperkäfig, is planned preferably, braked is that the removed end position by two couples of Anbremsselementen anfahrbar. In this case is planned especially that the Wälzkörperkäfig carries respectively an Anbremsselement of each couple of Anbremsselementen and each of the leadership rails opposite one another respectively an Anbremsselement of a couple by Anbremsselementen.

Supplementary to this it is braked is also in the invention appropriate for solution possible, that the pushed in end position through a couple of Anbremsselementen anfahrbar whereby one of the Anbremsselemente is arranged at the one leadership rail and the other of the Anbremsselemente at the other leadership rail.

Especially appropriately it is in this execution example if that is instructed as Anbremsselement trained into the reception hineinbewegbare part as a doubly causing Anbremsselement, so that this can serve on the one hand in addition to convey braked the removed end position or in addition serve can to convey braked the pushed in end position whereby this Anbremsselement cooperates at the same time with respectively an Anbremsselement trained as reception. For example that is held one of this Anbremsselemente at the Wälzkörperkäfig and the other at the opposite leadership rail.

The invention appropriate for solution can be used however not only advantageously in statement leaderships with two leadership rails, but rather also then if the statement leaderships are constructed out of three leadership rails. In this case, advantageous manner is planned that at the second leadership rail a third leadership rail is stored by means of Wälzkörpern received in a Wälzkörperkäfig in Ausziehrichtung verschieblich.

Preferably is planned also in this execution example, braked is that the removed end position of the third leadership rail relatively to the second leadership rail by at least a couple of Anbremsselementen anfahrbar. Yet better it is braked is, if the removed end position - like before propriety clarified - through two couples of Anbremsselementen anfahrbar whereby especially the Wälzkörperkäfig carries respectively an Anbremsselement of each couple.

Furthermore a couple of Anbremsselementen is planned for the braked conveying of the pushed in end position also, of which each sits at one of the neighboring leadership rail.

Further features and advantages of the invention are object of the following description as well as the graphic representation of some execution examples.

Show in the drawing:

Fig. 1 a horizontal cut through an invention appropriate for statement leadership in removed end position along line 1-1 in fig. 2;

Fig. 2 a side view of that in fig. 1 represented statement leaderships in the removed end position;

Fig. 3 a cut similarly fig. 1, along line 3-3 in fig. 4 in the pushed in end position;

Fig. 4 a side view similarly fig. 2;

Fig. 5 a cut similarly fig. 1, along line 5-5 in fig. 6 in removed end position of the middle leadership rail relatively to the body page leadership rail;

Fig. 6 a side view similarly fig. 2;

Fig. 7 a thereon visibility of ahead toward the arrow A in fig. 6 on the invention appropriate for statement leadership in pushed in end position;

Fig. 8 a horizontal cut, along line 8-8 in fig. 9 through an invention appropriate for Wälzkörperkäfig;

Fig. 9 a side view similarly fig. 2 of the invention appropriate for Wälzkörperkäfigs;

Fig. 10, 11 and 12 an ausschnittsweise representation of a couple of cooperating invention appropriate for Anbremsselemente enlarged whereby one as a reception and the other as into the reception hineinbewegbares part is instructed and fig. 10 a relative position of the Anbremsselemente before entrance of the brake effect, fig. 11 a relative position in entered brake effect and fig. 12 an end position in preceding maximal brake effect represent;

Fig. 13 an end position of an invention appropriate for couple of Anbremsselementen, of which each is arranged at a leadership rail, in conveyed pushed in end position.

An in fig. 1 as entire with 10 designated execution example of an invention appropriate for statement leadership for one out of a body 12 in an Ausziehrichtung of 16 extensible or in this in Einschieberichtung 18 einschiebbaren statements 14 a body page leadership rail 20, a statement page leadership rail 22 comprises, and a middle leadership rail 24, which at the body page leadership rail 20 by means of an upper sentence 26 and a lower sentence 28 of Led are by Wälzkörpern in a Wälzkörperkäfig 30. In same manner, the middle leadership rail 24 is stored relatively to the body page leadership rail by means of an upper sentence 32 and a lower sentence 34 of Wälzkörpern verschieblich, which are led also in a Wälzkörperkäfig 36.

The body page leadership rail 20 are bent at the same time in the cross-section approximately C-förmig and shows a means thigh 40 up, of which two breadth thighs 42 stand off and 44, that are equipped with an upper course 46 and/or a lower course 48 for the upper sentence 26 of Wälzkörpern and/or the lower sentence 28 of Wälzkörpern.

A lower course 52 for the upper sentence and an upper course 54 for the lower sentence of 28 the Wälzkörper is formed at the same time of breadth thighs 56 and/or 58 of the middle leadership rail 24 whereby the breadth thighs 56 are arranged and 58 at a means thigh 60.

The middle leadership rail 24 shows furthermore a means thighs 62,60 connected with the means thigh up, by which also two breadth thighs 64 stand off and/or 66, that into opposed directions of wise like the breadth thighs 56 and 58.

Also the statement page leadership rail 22 comprises a means thigh 70 with two breadth thighs 72 and 74, which extend in the distance of the breadth thighs 64 and 66, so that the upper sentence of Wälzkörpern 32 adjoins at an upper course 76 and the lower sentence 34 of Wälzkörpern at a lower course of 78 the breadth thighs 72 and 74, during the upper sentence 32 of Wälzkörpern 64 and the lower sentence 34 of Wälzkörpern at an upper course of 84 the breadth thigh 66 runs.

In the moving of the statement page leadership rail 22 of that in fig. 3 and 4 represented pushed in end positions in that in fig. 1 and 2 represented removed position is assumed for example that the middle leadership rail 24 moves first of all relatively to the body page leadership rail 20, while the statement page leadership rail 22 remains relatively to the middle leadership rail 24 in its position. This has as a consequence, that first of all the middle leadership rail 24, like in fig. 5 and 6 represented, full removed becomes relatively the body page leadership rail 20 in the Ausziehrichtung 16, so that this that in fig. 5 and 6 represented removed end position reaches.

This end position is determined at the same time through a rear, at the means thigh 60 arranged and

toward the body page leadership rail 20 projecting Anbremsselement 100 as well as one front, at the means thigh 40 arranged and toward the middle leadership rail 24 overcoming Anbremsselement 110 whereby the rear Anbremsselement 100 cooperates with an Anbremsselement 30 arranged rear at the Wälzkörperkäfig 102, during the front Anbremsselement 110 with a front Cooperates.

How in fig. 10, 11 and 12 enlarged represented, comprises for example the rear Anbremsselement 100 a reason body 120, which is equipped with a with day opening 122, through which a bent lax 124 of the means thigh 60 through handle to fix, around the reason bodies 120. Of the reason body 120, 16 oblique places fingers 126, 128 stand off in an angle alpha vis-à-vis the Ausziehrichtung whereby the angle DEG amounts to for example order of magnitude moderate 60 alpha. The fingers 126 and 128 are there relative to the reason body 120 toward a reduction of the angle alpha movable, preferably through it, that both the fingers 126 and 128 and the reason bodies 120 out of an elastic material produced are preferably extends between the fingers 126 and 128 another with the fingers 126 and 128 connected arches 130, which also deformierbar and relatively to the reason body 120.

The Anbremsselement 100 cooperating with the Anbremsselement 102 comprises sharpen a reception 134, which in one angle concrete to the Ausziehrichtung 16 passing and in direction of motion of the Anbremsselements 100 in the direction of the Anbremsselement 102 to conical narrowing start areas 136 and 138 comprises itself, is larger, which show entrance page the reception 134 diagonally to the Ausziehrichtung 16 a distance from one another, which than a distance of the fingers 126 and 128 142 and 144.

The rear rail page Anbremsselement 100 moves now into the cage page Anbremsselement 102 in, the tip 142 and 144 of the fingers 126 and 128 at the start areas 136 come and 138 to the unit and become then over a brake way W based on the conical start areas passing on each other 136 and 138, like in fig. 10, 11 and 12 represented, moves successive under reduction of the angle alpha so far on each other, until the fingers 126 and 128, like in fig. 12 represented, pass approximately parallel to the Ausziehrichtung 16 and adjoin the tip 142 and 144 at an Endfläche of 140 the reception 134.

The Deformierung of the fingers 126 and 128 in the shrinking into the reception 134 W leads at the same time in the course of the brake way to a permanently more largely becoming friction between the start areas 136 and 138 as well as the fingertips 142 and 144 so that by the increasing friction the rail page Anbremsselement 100 always more strongly is braked in the shrinking into the reception 134, without that at the same time an elastic repercussion appears The fingertips 142 and 144 after the braking in the end position stand remain and based on the friction and the inclination of the start areas 136 and 138 no opposed out of which end position herausführende movement release.

In same manner as well as in the fig. 10 to 12 in the connection with the rail page Anbremsselement 100 and the cage page Anbremsselement 102 described, causes that at the means thigh 40 of the body page leadership rail 20 arranged and toward the middle leadership rail 24 projecting rail page Anbremsselement 110 with the cage page Anbremsselement 112 together, so that altogether in the shrinking of the middle leadership rail 24 relatively to the body page leadership rail 20 102 and/or 110 and is 112 effective.

This brake force affects Exclusively the leadership rail 20 mobile middle relatively to the body page leadership rail 24 and leads in addition that with increasing brake force increasingly a Gleitbewegung between the statement page leadership rail 22 and the middle leadership rail 24 under lifting of the friction between this and the sentences by Wälzkörpern 32 begins and 34, so that that in statement leaderships well known until now appearing "middle blow" Leadership rail 22 relative to the middle leadership rail 24 noticeable is not.

The statement page leadership rail 22 moves now relatively to the middle leadership rail 24 in Ausziehrichtung 16 into its removed and in fig. 1 and 2 represented end position, goes this also so long until a rail page Anbremsselement 200 with a cage page Anbremsselement of 202 the Wälzkörperkäfigs 36 and a further rail page Anbremsselement 210 with a cage page Anbremsselement of 212 the Wälzkörperkäfigs 36 cooperate, whereby the rail page Anbremsselement 200 is arranged at the means thigh 62 and the rail page Anbremsselement 210 at the means thigh 70 of the statement page leadership rail 22.

The respectively in pairs cooperating Anbremsselemente 200 and 202 as well as 210 and 212 function at the same time in same manner as well as in the connection with the couple of Anbremsselementen 100 and 102 represented and described.

Therewith is reached in addition that also in the shrinking into the removed end position an Abbremsung of the statement page leadership rail 22 results relatively to the middle leadership rail 24 and therefore also a "soft" shrinking enters into this removed end position.

Even if in the execution example described until now coming from the pushed in end position in fig. 3 and 4 in the removing of the statement 14 in Ausziehrichtung 16 first of all the relative movement between the middle leadership rail 24 and the statement page leadership rail 22 use should while the middle leadership rail remains 24 relative to the body page leadership rail 20 immovable, steps influence also no so-called "middle blow", for in this case first of all the Anbremsselemente 200 and 202 as well as 210 and 212. On the basis of whose effect the middle leadership rail 24 to move begins, so that also in this case the so-called "middle blow" is avoided.

Around also in the pushing in of the statement 14 of that in fig. 1 and 2 represented removed positions in that in fig. 3 and 4 represented pushed in end position to avoid the so-called "middle blow", an Anbremskörper 150 is planned in the area of a front end of the means thigh 70 the statement page leadership rail 22, is, which is equipped with an Anbremsselement 214, that on the one hand in a position with the Anbremsselement 24 held in the front area the means thigh 62 the middle leadership rail 210 to cooperate.

To this the Anbremsselement 210 is, like in fig. 13 enlarged represented, equip itself with both in Ausziehrichtung 16 and in Einschieberichtung 18 of the reason body 120 away extending fingers 126a, 128a and/or 126b, 128b so that in this case the fingers 16 showing in Ausziehrichtung 126a and 128a with the reception of 134 the Anbremsselements 214 cooperate, while the Einschieberichtung are showing finger 126b and 128b in a position, with which cage page Anbremsselement 212 cooperate.

How in fig. 8 and 9 in the connection with the Wälzkörperkäfig 30 represented, are itself the cage page Anbremsselemente 102 and 112 respectively into a rear Endbereich 160 and a front Endbereich of 162 a means footpath 164 of the Wälzkörperkäfigs 30 on forms, whereby the means footpaths 164 parallel to the means thigh 40 of the body page leadership rail 20 or parallel to the means thigh 70 of the statement page leadership rail 22 or Extends and lies preferably in a middle area between one another turned to means thighs 40 and 60 or 62 and 70.

Furthermore is equipped preferably the means footpaths 164 in the area of the Endfläche 140 of the receptions 134 in addition with a strengthening bulge 166, around this to the reception of the mechanical loads to versteifen.

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